

place of discharge of the products of combustion to the atmosphere and the means of discharge of such products shall be such as to minimize the likelihood of their reentry into the vehicle under all operating conditions.

(10) *Combustion chamber construction.* The design and construction of any combustion-type heater except cargo space heaters permitted by the proviso of paragraph (c)(9) of this section and unenclosed flame heaters used for heating cargo of tank motor vehicles shall be such as to provide against the leakage of products of combustion into air to be heated and circulated. The material employed in combustion chambers shall be such as to provide against leakage because of corrosion, oxidation, or other deterioration. Joints between combustion chambers and the air chambers with which they are in thermal and mechanical contact shall be so designed and constructed as to prevent leakage between the chambers and the materials employed in such joints shall have melting points substantially higher than the maximum temperatures likely to be attained at the points of jointure.

(11) *Heater fuel tank location.* Every bus designed to transport more than 15 passengers, including the driver, with heaters of the combustion type shall have fuel tanks therefor located outside of and lower than the passenger space. When necessary, suitable protection shall be afforded by shielding or other means against the puncturing of any such tank or its connections by flying stones or other objects.

(12) *Heater, automatic fuel control.* Gravity or siphon feed shall not be permitted for heaters using liquid fuels. Heaters using liquid fuels shall be equipped with automatic means for shutting off the fuel or for reducing such flow of fuel to the smallest practicable magnitude, in the event of overturn of the vehicle. Heaters using liquefied petroleum gas as fuel shall have the fuel line equipped with automatic means at the source of supply for shutting off the fuel in the event of separation, breakage, or disconnection of any of the fuel lines between the supply source and the heater.

(13) *"Tell-tale" indicators.* Heaters subject to paragraph (c)(14) of this sec-

tion and not provided with automatic controls shall be provided with "tell-tale" means to indicate to the driver that the heater is properly functioning. This requirement shall not apply to heaters used solely for the cargo space in semitrailers or full trailers.

(14) *Shut-off control.* Automatic means, or manual means if the control is readily accessible to the driver without moving from the driver's seat, shall be provided to shut off the fuel and electrical supply in case of failure of the heater to function for any reason, or in case the heater should function improperly or overheat. This requirement shall not apply to wood charcoal heaters or to heaters used solely to heat the contents of cargo tank motor vehicles, but wood charcoal heaters must be provided with a controlled method of regulating the flow of combustion air.

(15) *Certification required.* Every combustion-type heater, except wood charcoal heaters, the date of manufacture of which is subsequent to December 31, 1952, and every wood charcoal heater, the date of manufacture of which is subsequent to September 1, 1953, shall be marked plainly to indicate the type of service for which such heater is designed and with a certification by the manufacturer that the heater meets the applicable requirements for such use. For example, "Meets I.C.C. Bus Heater Requirements," "Meets I.C.C. Flue-Vented Cargo Space Heater Requirements," and after December 31, 1967, such certification shall read "Meets FMCSA Bus Heater Requirements," "Meets FMCSA Flue-Vented Cargo Space Heater Requirements," etc.

(i) *Exception.* The certification for a catalytic heater which is used in transporting flammable liquid or gas shall be as prescribed under §177.834(1) of this title.

[33 FR 19735, Dec. 25, 1968, as amended at 40 FR 51198, Nov. 4, 1975; 53 FR 49401, Dec. 7, 1988]

#### § 393.78 Windshield wiping and washing systems.

(a) *Vehicles manufactured on or after December 25, 1968.* Each bus, truck, and truck-tractor manufactured on or after

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December 25, 1968, must have a windshield wiping system that meets the requirements of FMVSS No. 104 (S4.1) in effect on the date of manufacture. Each of these vehicles must have a windshield washing system that meets the requirements of FMVSS No. 104 (S4.2.2) in effect on the date of manufacture.

(b) *Vehicles manufactured between June 30, 1953, and December 24, 1968.* Each truck, truck-tractor, and bus manufactured between June 30, 1953, and December 24, 1968, shall be equipped with a power-driven windshield wiping system with at least two wiper blades, one on each side of the centerline of the windshield. Motor vehicles which depend upon vacuum to operate the windshield wipers, shall have the wiper system constructed and maintained such that the performance of the wipers will not be adversely affected by a change in the intake manifold pressure.

(c) *Driveaway-towaway operations.* Windshield wiping and washing systems need not be in working condition while a commercial motor vehicle is being towed in a driveaway-towaway operation.

[70 FR 48054, Aug. 15, 2005]

## § 393.79 Windshield defrosting and defogging systems.

(a) *Vehicles manufactured on or after December 25, 1968.* Each bus, truck, and truck-tractor manufactured on or after December 25, 1968, must have a windshield defrosting and defogging system that meets the requirements of FMVSS No. 103 in effect on the date of manufacture.

(b) *Vehicles manufactured before December 25, 1968.* Each bus, truck, and truck-tractor shall be equipped with a means for preventing the accumulation of ice, snow, frost, or condensation that could obstruct the driver's view through the windshield while the vehicle is being driven.

[70 FR 48054, Aug. 15, 2005]

## § 393.80 Rear-vision mirrors.

(a) Every bus, truck, and truck tractor shall be equipped with two rear-vision mirrors, one at each side, firmly attached to the outside of the motor vehicle, and so located as to reflect to the driver a view of the highway to the

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rear, along both sides of the vehicle. All such regulated rear-vision mirrors and their replacements shall meet, as a minimum, the requirements of FMVSS No. 111 (49 CFR 571.111) in force at the time the vehicle was manufactured.

(b) *Exceptions.* (1) Mirrors installed on a vehicle manufactured prior to January 1, 1981, may be continued in service, provided that if the mirrors are replaced they shall be replaced with mirrors meeting, as a minimum, the requirements of FMVSS No. 111 (49 CFR 571.111) in force at the time the vehicle was manufactured.

(2) Only one outside mirror shall be required, which shall be on the driver's side, on trucks which are so constructed that the driver has a view to the rear by means of an interior mirror.

(3) In driveway-towaway operations, the driven vehicle shall have at least one mirror furnishing a clear view to the rear.

[48 FR 57139, Dec. 28, 1983]

## § 393.81 Horn.

Every bus, truck, truck-tractor, and every driven motor vehicle in driveaway-towaway operations shall be equipped with a horn and actuating elements which shall be in such condition as to give an adequate and reliable warning signal.

## § 393.82 Speedometer.

Each bus, truck, and truck-tractor must be equipped with a speedometer indicating vehicle speed in miles per hour and/or kilometers per hour. The speedometer must be accurate to within plus or minus 8 km/hr (5 mph) at a speed of 80 km/hr (50 mph).

[70 FR 48054, Aug. 15, 2005]

## § 393.83 Exhaust systems.

(a) Every motor vehicle having a device (other than as part of its cargo) capable of expelling harmful combustion fumes shall have a system to direct the discharge of such fumes. No part shall be located where its location would likely result in burning, charring, or damaging the electrical wiring, the fuel supply, or any combustible part of the motor vehicle.